Study Group on Development of Highly Skilled ICT Professionals—6th Meeting
Summary of Minutes

1. Date and Time

Tuesday, February 19, 2008; 14:00–16:00

2. Location

Conference Room 2, MIC

3. Attendees (honorifics omitted)

(1) Study Group Members

Muraoka (chair), Ishijima (vice chair), Onishi, Oba, Kakehi, Kitagawa, Saito, Shigeki, Dairiki, Nakajima (proxy: Oshima), Harasawa

(2) Observers

Takahashi (Director, IT Office, Cabinet Office), Fujiwara (Director, Technical Education Division, Higher Education Bureau, MEXT), Yahiro (Director, Information Services Industry Division, Commerce and Information Policy Bureau, METI), Ueda (Manager, Information Group, Secretariat, Japan Business Federation)

(3) MIC Representatives

Nakata (Director-General for Policy Planning), Matsui (Deputy Director-General), Suzuki (Director, General Policy Division), Matsukawa (Director, IT Utilization and Human Resources Development Division), Hisatsune (Examiner, Technology Policy Division), Ohara (Deputy Director, IT Utilization and Human Resources Development Division)

4. Meeting Proceedings

(1) Opening

(2) Based on Document 6-1, the Secretariat explained “Mismatching of industry needs and the content of education.”

(3) Based on Document 6-2, the Secretariat explained “Report Outline (draft).” The content of the discussion is summarized as follows.

[Regarding a new “place for workforce development”]

- While keeping a wide range of collaboration and continuity in mind, taking actions as new initiatives is necessary to be free from the conventional framework. In terms of organizational format, it might be good to place a greater weight on professional graduate schools at the beginning, although I do not mean to exclude general graduate schools.
- The concept of professional graduate school recommended by the Japan Business

Federation is to establish a sub-institution of the national institute for proving and improving specific functions. The idea is to create a model graduate school for demonstrating a new form of education and a base for providing the results of experiments to general graduate schools. It is not for satisfying the volume requirement for human resources.

- I thought professional graduate school is a good choice because of the possible difficulty in hiring key players from the industry as teaching staff of general graduate schools because most of them do not have a Ph.D. Furthermore, in the field relating to software engineering at university, students will not be able to gain skills and knowledge unless they learn the basics through direct involvement in actual projects.
- Not being able to hire someone as teaching staff without a Ph.D. sounds too extreme. A fair number of graduate schools hire teaching staff without a Ph. D.
- Implementing practical education desired by the industry will be very costly, and a strong commitment is required. It will be difficult to realize it without completing negotiations among stakeholders. Moreover, while industry asks for the creation of institutions for human resources development, no one will guarantee that a sufficient number of students will be secured. As a first step, a thorough investigation should be conducted to confirm the presence of a market mechanism for supplying customers.
- Shortage of highly skilled ICT human resources does not mean that we do not have sufficient people to design computers, but we are not keeping up with demands for people who can incorporate computers into various products and develop social systems because of the rapid increase of such demands. While it is permissible to keep conventional computer science departments in universities, education with a heavy focus on application technology needs to be examined.
- Currently, the human resources that are required are those who know both social mechanisms and the potential usage of computers in society. Education and training provided by companies center on OJT. Because there is no established academic system, a method like PBL is also used for providing additional experience. For establishing an academic system, we need to have something like a national institute for research, and an organization like professional graduate school to test the research results in practical activities.
- Universities are also changing, and accepting professors without a Ph.D. from industry. The biggest problem is the fact that companies cannot afford to offer talented workers to teach at universities. I think there are many people who are capable of providing practical lessons, but when a professional graduate school is created, is it possible to secure teachers? Students have their own needs too, and industry must have a mechanism to

appraise students with practical education in a fair manner. Otherwise, the program cannot last for a long time.

- Some universities have been actively accepting teaching staff from companies. How to incorporate such universities into the scheme is important. Talented people in companies are busy, and will not be able to participate in the program voluntarily for a long time. Perhaps, it is good to build a system to offer some sort of support as well as a system to prize their honor. For example, the top level of ITSS can be linked to professional qualification, and the people with the qualification can be registered at the national institute. Then, when they teach at a university, they can be recognized as top-ranked professionals. Something like this might make it easier for companies to dispatch people.
- Selecting good content from PBL and practical education to form a standard program might be effective.
- Education is costly. To implement this idea as national project, it is necessary to honor lecturers from industry, and they should be compensated adequately.
- In terms of academic framework, each site might develop various features and styles. Regarding teaching methods, there should be a mechanism for assessing and generalizing good methods. I support the idea of creating a new “place for workforce development,” but much preparation and investigation must be accomplished to determine what to do with the organization and the people to run the system, how to start and operate it, and how to ensure the creation of a sustainable system.
- Will there be only one model case, or multiple cases?
- Whether or not the industry will make financial contributions and provide top-level lecturers continuously will be an issue. Perhaps industry and academic society can provide funding and people for one or two model schools and the national institute can share information. Three to five years later, the program could then be rolled out nationwide while improving the quality.
- It is impossible to educate a large population by providing such schools all over Japan. It is good to gather top-level engineers in a model school and then establish the methodology. After that, the program could be rolled out nationwide using the identified methodology. This can be one of the possible approaches.
- How about creating a few leading organizations first, and have the total industry support the program? Then the program could gain momentum.
- An industry community is not a single organization, and nobody will be committed.
- In the CIO Strategy Forum, there was a discussion that Japanese management has no understanding of IT and IS. About 30% of companies are considering the optimization of ICT usage companywide, but the remaining 70% are keeping it at department level or

leaving it entirely to vendors. The effort of human resources development should be conducted together with the effort for enhancing the understanding of IT in companies.

- It is important to have a company's top management understand the importance of ICT utilization in companies. The Japan Business Federation is thinking of preparing a recommendation. We want to strongly propel the process of pushing the total scheme forward by developing human resources while educating top management people. For Kyushu University and Tsukuba University, we are moving forward with the name of the Japan Business Federation, but if the national government leads the program, it will be easier for companies to participate, even as volunteers.
- It is also necessary to upgrade the status of the people in charge of IT at universities.
- This is the same for companies. Efforts need to be made to energize corporate IS people.
- I wish to see people in charge of IT get respect even if they are middle school or high school teachers.
- The ratio of college students showing interest in this field is declining. I think young people's motivation in this field will increase if the status of computer science is upgraded as basic education and science, although this might not be what industry is interested in. We need to investigate ways to upgrade the science portion in universities.
- How to upgrade the level of the core part as a science is an important issue.
- Technical colleges were established to develop mid-level engineers, but this fact is now almost forgotten. If we were to create a vocational type of educational organization, it is necessary to ensure a certain level of sustainability, and the organization should be prepared to make changes in accordance with the surrounding environment. For this purpose, financial endorsement is also necessary.
- Computer science in graduate schools is very popular, but it is not as popular in undergraduate schools compared to the past. Information-related technology might be difficult for high school students to understand. By the way, many graduates from technical colleges are highly talented.

[Regarding "The Mechanism for Supporting the Place for Workforce Development" (National institute-like function)]

- While ministries, government agencies, universities, and companies have been working on various initiatives, many of them finish in a short term, and there is no mutual exchange among them. Most of them are small in scale. Those people engaged in those initiatives are working very hard, and there should be a mechanism to create a cross-project connection among all the initiatives. For this purpose, I wish you to create a venue where people can carry on dialogues almost permanently. In terms of people and

funding, I am thinking of public funding, but industry society is also committed to take a fair share.

- Speaking on behalf of companies, we can send employees as students, dispatch lecturers for about 3 years, and be considerate in the hiring process.
- I hope the system allows expansion to other schools so that educational institutions do not get the impression that it is a centralized system with government support backing it.
- It is important to keep the operation open to industry, government and academia so that the outcomes can be utilized anywhere.
- Regarding the operation of the national institute, functions should be grouped to a certain degree, and the government, industry and academia need to discuss and consider specific ways of operation by the group.
- Until a certain amount of expertise is accumulated, industry and academia must collaborate and operate the system by gathering the knowledge of many people.
- Various organizations have already started various initiatives, and we must coordinate with such activities well.
- In order to roll out the effort nationwide in the future, we need to consider standardizing things, generalizing teaching materials, and educating teaching staff.
- We need to have the stakeholders of each initiative get together, exchange opinions, mutually exchange people, and exchange curriculums. Perhaps we can start with something like a preparation committee for the national institute.
- In order to develop human resources who will lead Japan in ten years, the national institute should take the lead and build a new model that differs from what we have done so far.
- How about building a new model after gathering experiences and ideas from previous projects?

[Regarding “The need to take special measures for developing highly talented ICT human resources”]

- In the case of ordinary job types, human resources are supplied naturally by the market mechanism. The reason that highly skilled ICT human resources are short qualitatively as well as quantitatively might be due to the market mechanism not functioning sufficiently. If this is correct, why is the market mechanism not working? Without a common understanding, the prescription cannot be persuasive.
- There are two reasons. One is the fact that demands for IT engineers are increasing in the industry while the supply of human resources to satisfy the needs in the academic field is falling behind. Another reason is the availability of low-cost human resources in India

and China. While we have a shortage of IT engineers in Japan, the wage condition is exposed to tough international competition. Therefore, the market mechanism is not functioning independently in Japan.

- University education and industrial societies having different needs is not unique to the ICT field. In addition, the increasing mobility of human resources due to the rise of India and China is a good symptom in view of the market mechanism.
- IT is used in all industries, not just in the IT industry. Therefore, the IT industry needs to develop very diverse human resources to meet the requirements of all fields. If it is permissible not to have Japanese IT human resources because we can rely on India and China, then we do not need to worry about developing people, but by looking at the total industries in Japan as well as Japan's international competitiveness, we need to secure IT human resources in Japan.
- I suppose you are pointing out that if we rely on the market mechanism, we will totally depend on human resources from overseas and that will be a problem. If that is the case, we should organize our thinking based on the logic that we should not rely on the market mechanism. That is a different approach than the logic of eliminating the cause of the malfunction in the market mechanism.
- Study in the field of engineering requires patience because it requires students to learn from a very broad area, and this is not only regarding IT-related fields, but also the engineering field has not been evaluated properly because we have been looking at only the market activities. I think this is why the field of engineering is losing popularity. Declining popularity of the engineering field is a common trend in developed nations, but human resources development is particularly important for Japan because we do not have natural resources. For those who have studied hard for a long time, it should be recognized and appraised in a fair manner. We might discover human resources that become top management during the process of building up skills through basic to upper level training.
- Mismatching is not unique to the IT area, but I feel mismatching in IT is particularly serious. The reason that the information service industry has been hiring people regardless of their academic background might be because the method for developing people as professionals has not been established.
- Let's say we accept low-cost human resources from overseas, but we still need to secure Japanese people to take top management positions or we might not survive as a nation.
- In order to develop top management candidates, we need to upgrade the general standard. My understanding is that we are discussing creating a top league with the people having the level of skills acquired from graduate school or university in the science and

engineering fields, and try to achieve a ripple effect to the lower organizational tiers.

(4) Meeting adjourned.